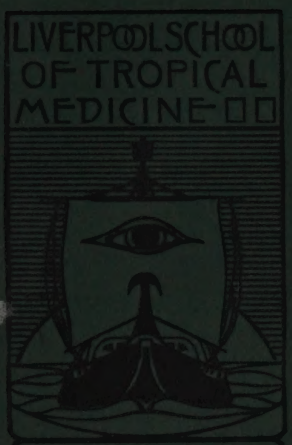
3418



ANNALS

Edited by
Prof. J. W. W. Stephens
Prof. R. Newstead
Prof. W. Yorke
and
Sir Ronald Ross

Editorial Secretary:
Dr. H. B. Fantham

On the Peculiar Morphological Appearances of a Malaria Parasite

J. W. W. STEPHENS, M.D. (Cantab.)

TROPICAL DISEASES BUREAU
RECEIVED
6 MAR 1915

REPRINTED FROM THE
ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY
Vol. IX, No. 1, March 1915

ISSUED BY
THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE

LIVERPOOL:
AT THE UNIVERSITY PRESS 57 ASHTON STREET

WELLCOME INSTITUTE LIBRARY
Coll. welTROmec
Call No. Pam
QX135
1915
S83a

22200128873

[*Reprinted from the 'Annals of Tropical Medicine and Parasitology,'*
Vol. IX, No. 1, March, 1915]

ON THE PECULIAR MORPHOLOGICAL APPEARANCES OF A MALARIA PARASITE

BY

J. W. W. STEPHENS, M.D. (CANTAB.)

SIR ALFRED JONES PROFESSOR OF TROPICAL MEDICINE, THE UNIVERSITY OF LIVERPOOL

(*Received for publication* 30 *Nov.*, 1914)

PLATE XII

In a paper entitled 'A new Malaria parasite of man' (1914), I described under the name *Plasmodium tenue* what I took to be a new species of malaria parasite. The peculiar morphological characters described were new to me, and I could find no illustrations or description of similar appearances.

Since writing the above-mentioned paper I have received through the kindness of Dr. Le Fanu, W.A.M.S., from the Gold Coast, a blood slide in which he thought he had recognised the forms I had described as *P. tenue*.

Dr Le Fanu had put this slide aside for further study, as he had noted before my description of *P. tenue* that there was something peculiar about the morphology of the parasites. The film was made from the blood of a native child that came for treatment. The infection is not a severe one: it is easy to find fields without any parasites. The forms in Dr. Le Fanu's slide are, however, in some respects even more peculiar than the *P. tenue* forms.

Firstly, I would point out that the blood cells present no evidence whatsoever of stretching or distortion, and the same peculiar forms of parasites occur in all parts of the film, thick and thin.

Secondly, there are present large forms of quartan parasites which appear to me to be *quite normal*. In the slide it is possible to trace a transition from normal ring forms to those in which *chromatin particles or strands without any protoplasm* occur in the red cells. A better idea of these will be got from the accompanying plate than from any description however detailed.

Three views seem to me possible as to the nature of these forms.

(1) That they are a new species of parasite.

(2) That they are degenerative, i.e., formed in the body under unknown conditions, and so perhaps analogous to the so-called quinine forms of parasites.

(3) That they are artificial, i.e., formed outside the body under unknown conditions.

The fact that among the parasites figured, forms are found in which chromatin alone without any protoplasm occurs in the red cell, is I think in favour of, but not decisive for, one of the latter two views rather than the first. The fact that normal quartan parasites are present is against these two latter views. It should be noted also that forms consisting of protoplasm alone, without chromatin, were not seen. Nor were pigment grains apart from parasites seen on the red cell.

While this paper was passing through the press, Balfour and Wenyon (1914) published a paper entitled 'The so-called *Plasmodium tenue* (Stephens).' In it they express the opinion that I had 'not produced any evidence to prove that he [I] was not dealing with an amoeboid sub-tertian parasite.' The fact that no observer (with perhaps one exception unknown to me when I wrote) since Laveran's discovery of the malaria parasite in 1880, i.e., during a period of thirty-five years, had described such amoeboid forms of the malignant tertian parasite, appeared to me to be very strong evidence against this view.

It is common knowledge that the malignant tertian parasite is to a certain extent amoeboid, but this is a very different condition from that I described in *P. tenue*. The authors quote for instance Ziemann, but a reference to his coloured plate will make it evident that he was not describing *P. tenue* forms. With regard to the possible exception I mentioned, I much regret that I had quite overlooked the existence of Dr. Balfour's plate published in 1908 and reproduced in the paper cited above. To Dr. Balfour certainly belongs the credit of the first description of markedly amoeboid forms of malaria parasites (other than the simple tertian), but a careful comparison of my plate illustrating *P. tenue* with that of Dr. Balfour will show that although there is a resemblance, it is not a close one. Now Ziemann's plate was published in 1906, and if extraordinary amoeboid activity of the malignant tertian parasite was already recognised it seems hardly necessary for Dr. Balfour to have published his plate of 'curious amoeboid forms' in 1908.

But to avoid controversial matter, let us now consider the substance of Balfour and Wenyon's paper. They figure two parasites, the first of which (in a single film from West Africa) is almost certainly identical with *P. tenue*, and possibly, too, this is true of the second parasite (from Bagdad). In this latter case, several films were taken just before death and an hour previously; all contained the same forms (Dr. Wenyon in a private letter). As to the nature of these parasites the authors appear to be in doubt, for in one part of their paper they state that 'it may be possible to find for these variations some mechanical explanation,' and in another that they are 'young parasites' (of *P. falciparum*) 'which are particularly amoeboid for some reason not clearly understood.'

Craig (1914), on the contrary, states that he 'is satisfied that *Plasmodium tenue* is an atypical form of *Plasmodium vivax*.'

It is perhaps not out of place to mention here that Emin (1914) has described a new malaria parasite under the name *Plasmodium vivax*, var. *minuta*.

When we have evidence as to what the nature of the forms I have described in this paper may be, and particularly whether they do or do not belong to the large quartan forms, we shall then probably be in a better position to estimate whether my view that *P. tenue* is a new species of malaria parasite is right or wrong.

It is of interest to record the result of an examination of further films from the case of *P. tenue*. Two films (March, 1914) showed quartan, and in one of the films a single pigmented (presumably simple tertian) parasite was found with the pigment in the form of rods, in an enlarged cell showing Schüffner's dots. Three films (June) showed quartan, and one (July), quartan. Young ring forms were not found in any of the films.

REFERENCES

Balfour, A., and Wenyon, C. M. (1914). 'The So-called *Plasmodium tenue* (Stephens).' Jour. of Trop. Med. and Hyg., Vol. XVII, p. 353.

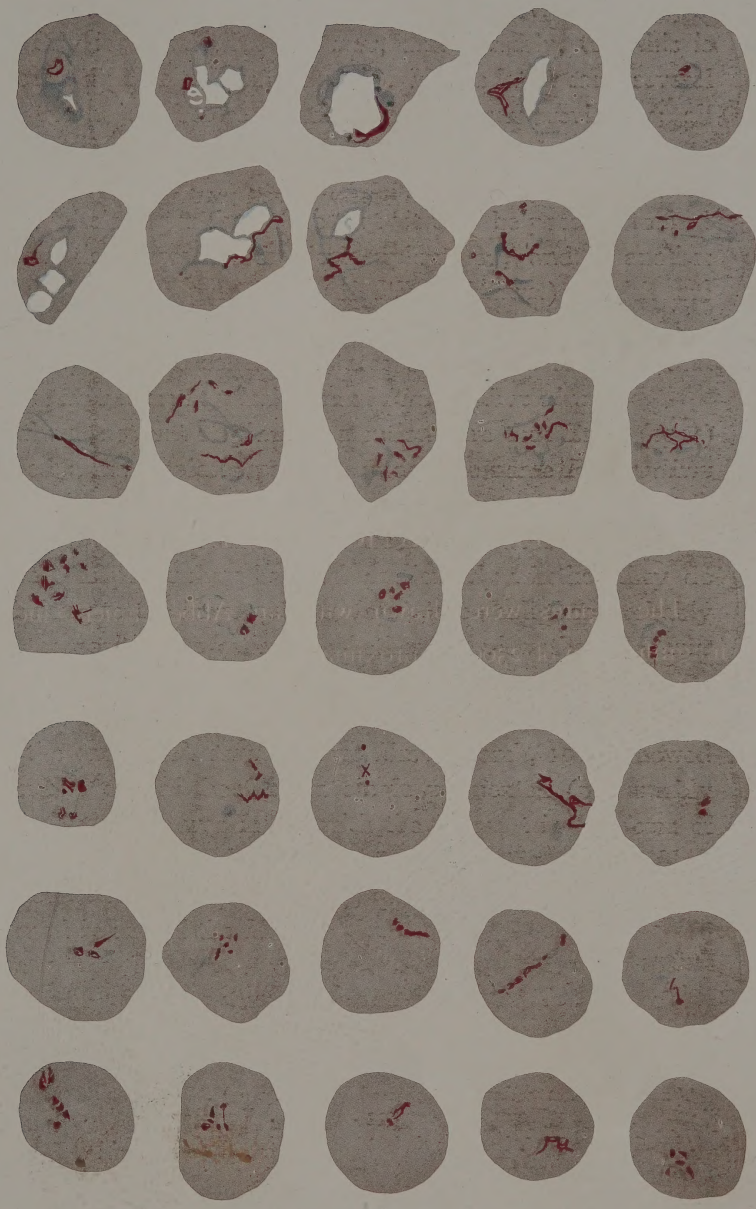
Craig, C. F. (1914). 'New varieties and species of Malaria plasmodia.' Jour. of Parasit. (Urbana, Illinois), Vol. I, p. 85.

Emin, A. (1914). 'Une variété nouvelle du parasite de Laveran.' Bull. Soc. Path. exot. t. VII, p. 385.

Stephens, J. W. W. (1914). 'A New Malaria Parasite of Man.' Proc. Roy. Soc., B. Vol. LXXXVII, pp. 375-377; and Annals of Trop. Med. and Parasit., Vol. VIII, pp. 119-122.

EXPLANATION OF PLATE XII

The figures were drawn with an Abbé camera lucida at a magnification of 2300 (approximately).



M.S.S. del.

WELLCOME LIBRARY INSTITUTE

EDITORIAL NOTICE

Articles for publication are accepted, if found suitable, from any source and will be understood to be offered alone to these Annals. They should be typewritten and addressed to :—

The Editorial Secretary
School of Tropical Medicine
The University
Liverpool

Illustrations for text figures should be drawn clearly and firmly in Indian ink, if possible, on Bristol board.

All lettering, names or legends on text-figures, charts or maps should be printed ***sufficiently large*** to allow of ***clear legibility*** on reduction if necessary.

Plates and illustrations should be accompanied by short explanations.

References to authors in the text must be made in the following way :— 'According to Smith (1900) the spleen is enlarged, but Robinson (1914) says the reverse.' The references should be collected in alphabetical order of authors' surnames at the end of the paper, and arranged in the following way :—

Robinson, S. (1914). 'The spleen in malaria.' *Annals of Nosology*, Vol. XX, pp. 20-25.

Smith, J. (1900). 'Enlargement of the spleen in malaria.' *Journal of Pathometry*, Vol. I, pp. 1-20.

Fifty reprints are supplied to each author, free of charge. Additional copies (up to 200) can be supplied at cost price.

Subscription : £1 2s. 6d. per volume, post free, payable in advance to the Secretary, Liverpool School of Tropical Medicine, B 10 Exchange Buildings, Liverpool. Correspondence concerning advertisements should also be addressed to the Secretary.